



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/772,499	01/29/2001	Alan Gatherer	TI-30024	1361

7590

04/13/2004

RONALD O. NEERINGS
Texas Instruments Incorporated
Mail Station 3999
P.O. Box 655474
Dallas, TX 75265

EXAMINER

VARTANIAN, HARRY

ART UNIT

2634

PAPER NUMBER

6

DATE MAILED: 04/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/772,499

Applicant(s)

GATHERER ET AL.

Examiner

Harry Vartanian

Art Unit

2634

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/31/2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Art Unit: 2634

Detailed Action

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claim 3-4, 6 are rejected under 35 U.S.C. 102(e) as being anticipated by Abbaszadeh (US Patent 6,563,877). Regarding Claim 3, Abbaszadeh meets the following limitations:

A method for bi-directionally processing a block of data, which does not necessarily have a known state at endpoints thereof, according to at least one sequencing constraint **fig 1a, 1b Note: Trellis codes use sequencing constraints**

sequentially processing data elements of the block in a first direction, **abstract**

after first processing prolog elements in said first direction in accordance with said sequencing constraint; and sequentially processing said data elements in a second direction, after first processing prolog elements in said second direction in accordance with said sequencing constraint. **(Column 5, Line 56 to Column 7, Line 26)**

In the above limitation regarding the use of the "prolog", Abbaszadeh designates "D" as his prolog. D is the window size. Please read Column 5, lines 49-67 and see fig 2.

Regarding Claim 4, Abbaszadeh meets the following limitations:

wherein the processing of data elements in the first direction, and the processing of data elements in the second direction are done in parallel. **(Column 5, Line 56 to Column 6, Line 7)**

Regarding Claim 6, Abbaszadeh meets the following limitations:

A method for parallel MAP **(Column 5, Line 56 to Column 6, Line 7)** processing of a lattice-coded block of data **fig 1a, 1b Note: trellis uses a lattice type coding structure.**

Art Unit: 2634

dividing the data into sliding window blocks, and, for each of multiple ones of said sliding window blocks, **abstract**

a) sequentially processing the elements of the respective sliding window block in a first direction, after first processing prolog(elements in said first direction in accordance with a sequencing constraint; and **(Column 5, Line 49 to Column 7, Line 26)**

b) sequentially processing the elements of the respective sliding window block in a second direction, after first processing prolog elements in said second direction in accordance with said sequencing constraint; **(Column 6, Line 12-31)**

wherein said steps a) and b) are performed at least partly in parallel with each other. **Fig 3**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

1. Claim 1-2, 5, 7, 8-10, 11, 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abbaszadeh (US Patent 6,563,877) in view of Viterbi(US Patent 5,933,462). Abbaszadeh meets the following limitations of Claim 1:

A MAP decoding(**title**) method, comprising the steps of:

performing a first sliding window operation in a first direction on at least a partial block of data, to thereby obtain first derived parameters; **Abstract**

Art Unit: 2634

performing a second sliding window operation in a second direction, which is opposite to said first direction, on at least a partial block of said data, to thereby obtain second derived parameters; **Abstract**

processing said first and second derived parameters, to thereby generate data estimate values; **Abstract; fig 3, item 22**

Abbaszadeh fails to teach the use of pipelining in his MAP decoding method.

However, Viterbi meets the following limitations of the Claim:

wherein said sliding window operations are pipelined with each other, to operate in parallel on different respective portions of data. **(Column 11, lines 47-54)**

Therefor, it would have been prima facie obvious to a person having ordinary skill in the art to which said subject matter pertains to use pipelining in a parallel, sliding window MAP decoder. The motivation to combine is stated by Viterbi in (Column 11, lines 47-54) where he states that pipelining can help minimize delay.

Regarding Claim 2, Abbaszadeh meets the following limitations:

divided into separate stages, and the separate stages operate in parallel on different partial blocks of data. **Fig 4, 7a,7b 10; (Column 5, Line 56 to Column 6, Line 7);**

Regarding Claims 5 and 7, the rejection for Claim 1 applies here. Abbaszadeh met all the limitations of the base independent Claim 3(see above paragraphs). Claims 5 and 7 are describing the parallel pipelining step that was rejected with Viterbi's disclosure above.

Regarding Claim 8, Abbaszadeh meets the following limitations:

A method for parallel MAP processing **(Column 5, Line 56 to Column 6, Line 7)**

a) combining probability metrics in at least one adder tree; and **fig 3, item 22**

b) performing an maximum-finding operation to combine ones of said metrics which correspond to alternative possibilities; **(Column 6, Line 63 to Column 7, Line 26)**

Regarding the final limitation in Claim 8 of the use of pipelining, the rejection for Claim 1 above as applies here.

Art Unit: 2634

Regarding Claim 9, Viterbi meets the following limitations:

wherein the maximum-finding operation is an exponent-logarithm equation. **(Column 7, line 45 to column 8, line 21)**

Regarding Claim 10, Viterbi meets the following limitations:

wherein the maximum-finding operation is an estimation of an exponent-logarithm function. **(Column 7, line 45 to column 8, line 21)**

Regarding Claim 11, Abbaszadeh meets all the limitations of the Claim(see above paragraphs) including the use of a "normalization operation on the results" (see and read about fig 9).

Regarding Claim 12, Viterbi meets the following limitations:

wherein the maximum-finding operation is an exponent-logarithm equation. **(Column 7, line 45 to column 8, line 21)**

Regarding Claim 13, Viterbi meets the following limitations:

wherein the maximum-finding operation is an estimation of an exponent-logarithm equation. **(Column 7, line 45 to column 8, line 21)**

2. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Abbaszadeh (US Patent 6,563,877) in view of Viterbi(US Patent 5,933,462) furtherer in view of Van Stralen et al (Us Pat #6,304,996). Abbaszadeh and Viterbi met all the limitations of Claim 14, except disclosing a alpha and beta generation process in their Map decoding systems.

However, Van Stralen et al meets the following limitations of the Claim:

an alpha generation process; **(Column 1, Line 45 to (Column 2 , Lines 5)**

a beta generation process; **(Column 1, Line 45 to Column 2, Lines 5)**

Therefor, it would have been prima facie obvious to a person having ordinary skill in the art to which said subject matter pertains to use an alpha and beta generator in a pipelining,

Art Unit: 2634

parallel, sliding window MAP decoder. The motivation to combine is stated by Van Stralen et al. They state the alpha and beta processes are essentially equivalent to the forward and backward recursions stated by Abbaszadeh. More specifically, he states:

"Three fundamental terms in the MAP algorithm are the forward and backward state probability functions (the alpha and beta functions, respectively) and the a posteriori transition probability estimates (the sigma function)." **(Column 1, Lines 22-36)**

The motivation to do the alpha and beta operations in parallel are also stated by Van Stralen et al:

"Two gamma probability function values are provided via selection switches to the alpha and beta blocks for calculating the alpha and beta probability function values, i.e., performing the alpha and beta recursions, respectively, in parallel, thus significantly increasing decoding speed." **(Column 1, Line 45 to Column 2, Lines 5)**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry Vartanian whose telephone number is 703.305.8698. The examiner can normally be reached on 9-5:30 Mondays to Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703.305.4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Harry Vartanian
Examiner
Art Unit 2634

Application/Control Number: 09/772,499

Page 7

Art Unit: 2634

HV



STEPHEN CHIN
SUPERVISORY PATENT EXAMINE
TECHNOLOGY CENTER 2600